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THE
ADVANTAGES AND METHOD
OF
WATERING MEADOWS
BY ART.

THE SECOND EDITION,
WITH TWO DESCRIPTIVE PLATES;

AND WITH
OCCASIONAL EXTRACTS AND REMARKS

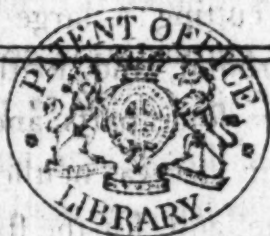
UPON
WIMPEY, FORBES, BOSWELL,
AND OTHER WRITERS ON THIS SUBJECT.

BY THE REV. T. WRIGHT,
CURATE OF SOUTH CERNEY, GLOUCESTERSHIRE.

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ORIGIN OF WATERING.

TO the questions that have been proposed to me respecting the origin of watering meadows *by art*, it is not in my power to give any precise and determinate answer. Tradition however says, that it has been practised in this county for almost a century; and the oldest people, with whom I have conversed upon the subject, tell me, that one Welladvise, an opulent farmer of South-Cerney, was the first that ever attempted any thing of the kind; and by this silly fancy, as it was called, he forfeited his honourable name, and received that of Madman; but fortunately, this unmerited distinc-

tion was as speedily removed as it was rashly confer'd. This reputed madman made his first experiment by cutting a large ditch into the middle of his ground, and so threw the water over it to flow in some parts, and to stagnate in others ; which in fact was neither doing service nor injury to the land, for the stagnation was as prejudicial to one part, as the running water was profitable to the other. Finding the result not adequate to his expectations, he improved his plan by cutting drains, and filling up all hollow places in his meadow, by which he made so great and so rapid a proficiency, that soon commanded not only the approbation, but likewise the imitation of all his neighbours who had any regard to their own interest.

Ever since this period have the inhabitants of this village enjoy'd (in their own imagination) the undisputed honour of the invention of this most advantageous practice in agriculture. But this claim, last year, we were compell'd reluctantly to relinquish, on reading the following
note

note in the Monthly Review for October, 1788,
P. 384.

“ We thank D. N. for his information con-
“ cerning the antiquity of watering meadows in
“ England, and particularly on the borders of
“ Wales. The most ancient trace of the practice
“ which he could discover in print, is in a book
“ entitled, “ *Water Workes*,” written by Rowland
“ Vaughan, who seems to have been the in-
“ ventor of the art, and to have practised it
“ in great perfection, and on a most extensive
“ scale, in the Golden Valley in Hereford-
“ shire, during the reigns of queen Elizabeth,
“ and king James the First.”

T H E



THE ADVANTAGES.

THE advantages arising from watering land, or throwing a thin sheet of running water over its surface, are many and great. If it be well executed, I may freely venture to assert, that this mode of cultivation will be found more productive than any other modern improvement in agriculture. By it, land, of whatever kind or quality, is increased to double or treble its former value. And it does not derive this enriching power from the assistance or spoil of the neighbouring fields, but independently of all other things, diffuses a general fertility. It does not rob the farm-yard of its Stores, nor even take back from the abundance which it there produces: for it stands in need of no dung, no expensive preparation of manure or compost. So that the farmer who occupies fifty acres of this watered land has an hundred tons
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of hay to carry off and spend upon his other grounds. But it is not merely the *Crop* that constitutes the great excellence of watering; it is the *Earliness* and *Certainty* of that crop.

Of the great value of grass very early in the spring every rational farmer is sensible; but rather let those estimate it who have a large stock of cattle in the months of March and April, and have but little hay for their support. By watering, we have plenty of grass at the beginning of March, and when the season is mild, somewhat earlier. And the good effects that this grass has upon all kinds of cattle, more especially those that have been hardly wintered, is truly astonishing. And the farmers here are enabled to begin cheese-making, at least a month sooner than their neighbours who enjoy not the advantage of watering their land.

With respect to the nurture of lambs, the value of this grass is inestimable: not only of those

8 OF WATERING

those intended for fattening, but those likewise designed for store. For it is a truth well known, tho' not sufficiently attended to, that if lambs in their early days are stinted and stopped in their growth, they receive from thence an unhappy contraction in their nature, which they not only retain for life, but in some measure communicate to their young. The early spring feed of these meadows is therefore most salutary and effectual in the prevention of this evil: and there is great reason to believe, that if the young of all kinds of Farmers Stock were immediately encouraged by a plenitude of food, and continually kept in a growing state, we should in a few years see a noble change both in the size and shape of cattle in general.

With regard to the *Certainty of a Crop*, I need not say much, the thing will speak for itself. Between March and May we are sure of Spring-feed worth at least a Guinea *per acre*; in June we have a crop of grass that will yield two tons of hay *per acre*; and the after-math is always worth

worth a pound. Let the summer be ever so dry, we are fortunate enough to have nearly the same quantity. Indeed after the last dry summer, the advantage of watering was abundantly evident; for the neighbouring hill-farmers were obliged to have recourse to the watered meadows, to purchase hay at four pounds *per* ton, or at whatever price the owners thought proper to demand.

Other advantages there are which ought not to be passed over unnoticed. The land thus treated is continually improving, tho' it is mown every year; its herbage, if coarse, is fined; its soil, if swampy, becomes sound; and an addition is made annually both to the depth and quality of its mould. "To these advantages (says Mr. Boswell in his copious treatise on this subject) another may be addressed to the gentleman who wishes to improve his estate, and whose benevolent heart prompts him to extend a charitable hand to the relief of the industrious poor, and not to idleness

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“ and vice ; almost the whole of the expences in
“ this mode of cultivation is the actual manual
“ labour of a class of people, who have no
“ genius to employ their bodily strength other-
“ ways, for theirs and their families support,
“ consequently viewed in this light, the ex-
“ pences can be comparatively but small, the
“ improvement great and valuable.”

As a kind of proof of some of the above assertions, I shall just mention the product of one of our meadows last year. It is one that has been watered longer than the memory of the oldest man in the parish, but is by no means the best meadow upon the stream, nor was the preceding winter favourable for watering. It contains six acres and a half. The spring-feed was let for seven guineas, and well supported near two hundred sheep from the first of March 'till the beginning of May : the hay was sold for thirty two guineas, and the after-math for six. But I have lately been informed of a still more remarkable proof of the happy effect of this practice.

tice. About five years ago, two of our most skilful watermen were sent for to lay out a meadow of seven acres, whose whole crop of hay that year was sold for so small a sum as two pounds. It was esteemed by many an impossibility to throw the water over it, but they soon effected it; and ever since that time the meadow has been let at the annual immense rent of three pounds an acre.

Thus encouraged by experience, this practice is become so prevalent with us, that the most simple spring or rivulet is never suffered to pass unnoticed and unstrained. Even wherever a sudden shower usually occasions a temporary flood, there proper ditches are made to receive the water, and spread it equally over the land, 'till it is completely drained of every particle of its fertilizing contents. Necessity indeed compels us to make the most of every drop, for we have near three hundred acres in this parish that must all, if possible, be watered, and the stream that must afford the water seldom exceeds five

yards in width and one in depth. Therefore I may say, that a scarcity of water is almost as much dreaded by us, as by the celebrated inhabitants of the banks of the Nile.

All the above advantages, and still greater, I am convinced might be reaped by many other people in the kingdom, provided they were acquainted with, and would attempt the following method. I mean to say this of such lands only as are situated near a stream that is sometimes thick or muddy; for if the water be always pure and simple, the effect will be by no means equal to the above. We have an instance of this in two of our meadows which are watered immediately from springs that rise in the grounds themselves. The crops of these meadows are early and plentiful, but not of a good quality; and the soil, having little sediment left upon it, remains unimproved after many years watering. But even in this case, be the water ever so clear, this practice is not unworthy of attention; for the water of most copious springs brings with it
a degree

a degree of warmth, as it is termed, that is proof against the frost, and has a good effect upon the first meadow that uses it. It keeps the land completely warm and sheltered from cutting winds, and the grass is continually growing in the severity of winter. But this effect in a great measure ceases when the water is used a second time, for when it has been spread in a thin sheet over the surface of a meadow, it will afterwards freeze as soon as rain-water.

I cannot dismiss this head without introducing, by way of confirmation, the opinion of men of judgment and real consequence.

The Analytical Reviewers, in their very zealous and cogent recommendation of *Watering*, speak thus. "To our certain knowledge, " many, very many streams, which might be " the means of disseminating abundance to the " fields upon their borders, are now suffered to " run to waste, and we consider every moment " that things are allowed to remain in this state,

as

“ as the loss of a treasure more precious than
“ gold itself. Having ourselves experienced
“ the benefit of this practice, in a district far
“ distant from Gloucestershire, we can attest,
“ that we have seen effects resulting from it
“ much greater than those which have been
“ specified to have arisen from it in that county.
“ Watering in a short time will convert the
“ thickest heath into the closest pile of grass,
“ and the barren soil, on which no kind of grain
“ could have been made to grow, will thus be
“ made to yield the most luxuriant crops of
“ corn as well as grass.”

The Monthly Reviewers likewise have repeatedly and most strenuously recommended this practice, which, they say, they know from experience to be well deserving the attention of the public.

Mr. Forbes likewise, who has written a very valuable treatise, entitled *Modern Improvements in Agriculture*, says, “ Some have been so sensible
“ fible

“ fible of the advantage of watering land, as to
“ employ windmills, pumps, and other engines
“ for this purpose, particularly that known by
“ the name of Archimedes’s screw ; and in
“ some circumstances the advantage is so great
“ as to answer the expence of raising the water
“ in this manner.”

And, “ should there, says Blythe, happen to
“ be a quantity of land that comes under this
“ description, (capable of being watered) not
“ one moment’s hesitation should be made
“ about the success, for the advantage is the
“ greatest that can be obtained by any mode
“ of husbandry, with the least expence, and the
“ greatest degree of certainty.”

With this strong evidence in its favour,
strange it seems that this practice has not already
become general in the kingdom. For there is
no stream or river in the kingdom, on which a
mill is or can be erected, but what may be made
very enriching to a certain quantity, perhaps a
large tract, of land.

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I am confident, that there are, in each county of England and Wales, two thousand acres, upon an average, which might be thus treated, and every acre encreased at least one pound in annual value. The general adoption therefore of watering is capable of being made a national advantage of more than one hundred thousand pounds *per annum*, besides the great improvement of other land, arising from the produce of the meadows, and the employ of thousands of industrious poor. Such an improvement, one would think, is not unworthy public notice ; but if I had doubled the sum, I believe I should not have exceeded the truth, tho' I might have gone beyond the bounds of general credibility. In this one parish, where I reside, there are about three hundred acres now watered, and it might easily be proved, that the proprietors of the land reap from thence a thousand pounds actual profit yearly.

I am happy in conjecturing, that the time is not very distant when watered meadows will be
viewed

viewed with admiration in every county of Great-Britain ; for within this half year I have been highly gratified in receiving applications from several gentlemen of very extensive property, and have sent experienced men into distant counties, to lay out meadows of this kind, which must prove a recommendation of the practice, far more striking and effectual than words or books can possibly be.

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T H E



THE METHOD.

BEFORE we proceed to the particulars of the method of watering, these three things are necessary to be considered. Will the stream of water that you mean to use admit of a temporary wear or dam across it? Can you dam up and raise the water a few inches higher than your meadow, without flooding and injuring your neighbour's land? And can you draw the water off your meadow as quick as it is brought on? If you are free from all objections of this kind, you may proceed in the following manner.

Having taken an accurate level of your ground, and compared it with that of the river, as near the dam as you can, (see plate 1. A. W.) cut a deep wide ditch, or the master work, and by it convey the water directly to the highest part of the meadow, keeping the
fides

fides or banks of the ditch of an equal height, and about three inches higher than the general surface of your meadow. In a large meadow, with an uneven surface, (see plate 2) sometimes three works are necessary in different directions, each five feet wide, if the meadow contains fifteen acres, and if the highest part of it be the farthest from the stream. In general, a ditch of ten feet wide and three deep will water ten acres of land. When there are three works in a meadow, and flood-hatches at the mouth of each, when the water is not sufficient to afford a complete covering for the whole at once; it may be watered at three different times, by taking out one of the hatches, and keeping the other two in. In this case, when the water has run over one division of the land for ten days, it may then be taken off that, and turned over another, by taking up another hatch, and letting down the first; and thus the three divisions may enjoy the water alternately, and each reap equal benefit. The bottom of the first work, or master-feeder, ought to be as deep as the bot-

tom of the river, when the fall in the meadow will admit of it; for the deeper you draw the water, the more mud it carries along with it. From the works, cut, at right angles, smaller ditches, or troughs, their width proportioned to the distance to which some part of the water is to be carried, and their distance from each other to be about twelve yards. A trough of two feet wide and one deep will water a surface of twelve yards wide and forty long. In each trough as well as work, place frequent stops or obstructions, especially when the water is rapid, to keep it high enough to flow through the notches, (or what we improperly call sluices,) or over the sides. The width of each work and trough is gradually contracted, as the quantity of water is continually decreasing the farther they proceed. Between every two troughs, parallel to and equidistant from each, cut a drain as deep as you please, and wide enough to receive all the water that runs over the two adjoining beds, and to carry it off into the master-drain with such currenncy as to keep the whole

whole sheet of water in constant motion, and, if possible, not to suffer one drop to stagnate upon the whole meadow. For a stagnation, (tho' it is recommended by a Mr. D. Young, for the improvement of arable land) is what we never admit in our system of watering, for we find that it rots the turf, soaks into and starves the land, and produces nothing but coarse grass, or aquatic weeds.

When a meadow lies cold, flat, and swampy, the width of the bed, or the distance between trough and drain, ought to be very small, never exceeding six yards; indeed in this case you can scarcely cut your land too much, provided water be plentiful, for the more you cut, the more water you require. The fall of the bed (see plate 1, fig. 2.) in every meadow, should be half an inch in a foot, less will do, but more is desirable; for when the draught is quick, the herbage is always fine and sweet. The water ought never to flow more than two inches deep,

deep, nor less than one inch, except in the warm months.

The Analytical Reviewers seem to think that the Gloucestershire farmers use more water than is necessary. To this I answer, that when water is plentiful, our farmers find it advantageous, in the beginning of Winter, to use even more than I have specified, and when it is scarce, they chuse to water only one half, or a less portion of a meadow at a time, and to give that a good covering, rather than afford a scanty one to the whole.

The Reviewers likewise recommend a repeated use of the same water upon different and lower parts of the same meadow, or to make each drain serve as a trough to the bed that is below it. This is a method which, tho' I am told it is in some measure adopted by the celebrated Mr. Bakewell, and taught by a systematic waterer in Staffordshire, I will venture to condemn, except when the great declivity of
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the land will admit of no other plan. This cannot be a proper mode of watering grass-land in the winter, for it can be of no service to the lowest parts of the meadow, unless as a wetting in Spring or Summer. The first or highest bed of a meadow laid out according to this plan, will indeed be much improved, the second may reap some benefit, but the third which receives the exhausted, thin, cold water, will produce a very unprofitable crop. Our farmers never chuse more than a second use in the same meadow, and that very seldom. They call even the second running by the significant name of small-beer, which, they say, may possibly satisfy thirst, but can give very little life or strength to the land. It is a much better method to have a meadow laid out so as to be watered at several times, and to be at the expence of several small flood-hatches, than to water the whole at once by means of catch-drains. One of our watermen laid out a meadow last year for Lord Talbot, at Rugely

in

in Staffordshire, which, I am confident, will soon discountenance the present plan of watering in that county.

Sometimes it is necessary in a large meadow to convey the water that has been used under the works and troughs, and then the water above is supported by means of boards and planks, which we call a carry-bridge. Sometimes, the better to regulate the course of the water on the surface, especially in the Spring, narrow trenches are dug, and the mould laid by the side of them, in order to be restored to its former place when watering is finished. The earth and mud thrown out in cleansing and paring the ditches should be carried to fill up the low, hollow parts of the meadow, and be trodden down with an even surface, which will easily be done when the water is on, the workman being always provided with a strong pair of water-proof boots. If the mould thus used has upon it a turf that is tolerably fine, place it uppermost, but if it is sedgey and coarse, turn

turn it under, and the water, if it runs quick, will soon produce upon it a fine herbage.

The grounds that are watered in the easiest and most effectual manner, are such as have been plowed, and ridged up in lands of about twelve yards wide ; here the water is easily carried along the ridge by means of a small ditch or trough cut along its summit, and then by means of the stops it is made to run down the sides or beds into the furrows, by which it is carried into the master-drain, which empties itself into the river. Every meadow, before it is well watered, must be brought into a form something resembling a field that has been thus left by the plow in a ridged state.

Mr. Wimpey says, “ a water-meadow is laid out in arched lands similar to the segment of “ a circle ;” but he should rather have said, that each side of the land ought to be, as nearly as possible, a perfect, inclined plane, that the

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water

water may flow down with the greater ease and quickness.

The structure of flood-hatches is so simple, and so well understood by every common carpenter, that it may be deemed unnecessary to insert a description. One hint however may not be improper, that their basis should be deep and firmly fixed, and well secured with stone and clay, to prevent its being blown up by the force of the water.

DIRECTIONS



DIRECTIONS FOR EACH MONTH OF WATERING.

AT the beginning of November, each work, trough, and drain, should be well cleaned, by the spade and breast-plow, of weeds, grass, and mud, and well repaired, if they have received injury from the feet of cattle. Then take the first opportunity after a shower, when the water is thick and muddy, of turning over your meadow almost as much water as you can, without injuring the banks of the works, especially if the land be poor. In this month the water contains much more salts and richness than later in winter.

“ This position, ” the Monthly Reviewers say, “ is a doubtful one ; ” and likewise assert, “ that many practical waterers will be of opi-

“ nion that the *muddiness* of the water is of little
“ consequence.”

As this comes from men of science, whose opinion is eagerly caught at and embraced by the public, and consequently, if it should prove erroneous, is the more apt to mislead, the reader will pardon me if I take up some pages in endeavouring to substantiate what I have asserted, especially as I shall have a fair opportunity of introducing some most valuable remarks of Wimpey and Forbes upon this head. That water at the beginning of November contains much more salts and richness than later in Winter, I still resolutely contend, tho' I am not able to prove it by any chymical analysis; for it seems to me evident, after the first washing of farm-yards, various sinks, ditches, and the surface of all the adjoining fields which have lain dry for some time, that the common stream should then contain much more fatness than when the same premises have been repeatedly washed. This our farmers boldly assert from
many

many years experience. If they can, at this season, obtain plenty of muddy water for one week, they esteem it of equal value with that of the whole winter following. But I shall not rest my argument on my own, or the authority of farmers, but shall take the liberty of introducing a powerful advocate, Mr. Forbes, who in mentioning the subject of watering, in his treatise, speaks thus to the point. P. 141.

" The water should be let in upon the
" meadow in November, when the first great
" rains make the river muddy, for then it is full
" of a rich sediment brought down lands of the
" country thro' which it runs, and is washed
" into it by the rain, and as the sediment
" brought by the first floods is the richest, the
" carriages and drains of the meadow should
" all be scoured clean and in order before these
" floods come."

In opposition to the opinion of "practical
" waterers, that the muddiness of the water is
of

of little consequence," I will not hesitate to affirm, that the mud is of as much consequence in winter-watering, as dung is in the improvement of a poor upland field. For each meadow in this neighbourhood is fruitful in proportion to the quantity of mud which it collects from the water. And indeed, what manure can be conceived more enriching than the abundant particles of putrid matter which float in the water, and are distributed over the surface of the land, and applied home to the roots of the grass. It is true, that any the most simple water thrown over a meadow in a proper quantity, and not suffered to stagnate, will shelter it in Winter, and in the warmth of Spring will force a crop, but this unusual force must exhaust the strength of the land, which will require an annual supply of manure in substance, or in a course of years the soil will be impaired rather than improved. The meadows in this county which lie next below a market-town, or village, are invariably the best, and those which receive the water after it has been used two or three times, reap proportionably

proportionably less benefit from it. For every meadow that is well laid out, and has any quantity of grass upon its surface, will act as a fine sieve upon the water, which, tho' it flow in ever so muddy, will be returned back to the stream as clear as it came from its fountain. This circumstance, when there is a range of meadows to be watered, the property of different persons, when water is scarce, creates vehement contentions and struggles for the first use; therefore the proprietors are compell'd to agree amongst themselves, either to have the first use alternately, or for the higher meadows to dam up and use only one half or a less portion of the river. Our farmers know the mud to be of so much consequence in watering, that whenever they find it collected at the bottom of the river, or the ditches, they hire men whole days to disturb and raise it with rakes made for the purpose, that it may be carried down by the water, and spread upon their meadows. We have one meadow in this parish which, I think, is an incontestible proof of the consequence of muddy

muddy water :— it is watered by a branch of the common stream that runs for about half a mile down a public road :— this water, by the mud on the road being continually disturbed by carriages and the feet of cattle, becomes very thick, and when it enters the meadow is almost as white as milk. This Field, which consists of seven acres, was, a few years ago, let at ten shillings *per* acre, but is already become the richest land in the parish, and has produced, at one crop, eighteen loads of hay, and each load more than twenty-five hundred weight.

If, however, the above assertions should appear inconclusive, I have it in my power to introduce authorities in my favour, which, I doubt not, must force conviction.

Mr. Wimpey, a man who in all his agricultural treatises discovers not only real erudition and practical knowledge, but a true philosophical *acumen*, in a letter inserted in the twenty-eighth number of the annals of agriculture, writes thus.

“ As

“ As to the sorts of water, little is to be
“ found, I believe, which does not encourage
“ and promote vegetation, even the most sim-
“ ple, elementary, uncompounded fluid : —
“ heat, and moisture, as well as air, are the
“ *sine qua non* of vegetation as well as animal
“ life. Different plants require different pro-
“ portions of each to live and flourish ; but
“ some of each is absolutely necessary to all.
“ However, experience as well as reason uni-
“ versally shews, that the more turbid, fecu-
“ lent, and replete with putrescent matter the
“ water is, the more rich and fertilizing it
“ proves. Hasty and impetuous rains, of con-
“ tinuance sufficient to produce a flood, not
“ only dissolve the salts, but wash the manure
“ in substance off the circumjacent lands into
“ the rapid current. Such turbid water is
“ both meat and drink to the land, and by
“ the unctuous sediment and mud it deposits,
“ the soil is amazingly enriched and improved.
“ The virtue of water from a spring, if at all
“ superiour to pure elementary water, is de-

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“ rived

“ rived from the several strata or beds of earth
 “ it passes thro’, that according to the nature of
 “ such strata, it may be friendly or otherwise
 “ to vegetation. If it passes thro’ chalk, marle,
 “ fossil, shells, or any thing of a calcareous
 “ nature, it would in most soils promote the
 “ growth of plants ; but if thro’ metallic ore,
 “ or earth impregnated with the vitriolic acid,
 “ it would render the land unfertile, if not
 “ wholly barren. In general, the water that
 “ has ran far * is superiour to that which im-
 “ mediately flows from the spring, and more
 “ especially that which is feculent and muddy,
 “ consisting chiefly of putrid animal substances
 “ washed down the stream.”

Mr. Forbes, also, confirms the above in the
 following words. “ There is great difference
 “ in the quality of water, arising from the par-
 “ ticles of different kinds of matter mixed with
 “ them. Those rivers that have a long course

* This (says Mr. A. Young, in a note) is a point of great im-
 portance. See Priestly on air, vol. 5. p. 31. A. Y.

“ thro’

“ thro’ good land, are full of fine particles,
“ that are highly fertilizing to the adjoining
“ meadows that are casually overflowed by
“ them; and this chiefly in floods, when the
“ water is fullest of a rich sediment: for when
“ the water is clear, tho’ it may be raised by
“ art high enough to overflow the adjoining
“ lands, and be of some service to them, the
“ improvement thus made is far short of what
“ is obtained from the same water when it is
“ thick and muddy.”

Mr. Boswell, likewise, is of the same opinion. “ From Michaelmas to Candlemas,” says he, “ great attention should be given to all
“ floods that may happen, whether from heavy
“ rains or the melting of snow, ice, &c. never
“ to let any pass unregarded, but all the weirs,
“ sluices, &c. should be opened, and as much
“ of the land as possible be flooded with it;
“ these waters are always thick and rich, being
“ the washing of all the country. A few days
“ therefore of such water is invaluable.”

In December and January, the chief care consists in keeping the land sheltered, by the water, from the severity of frosty nights. It is necessary, however, thro' the whole winter, every ten days or fortnight, to give the land air for a few days, by taking the water off entirely, otherwise it would rot and destroy the roots of the grass. It is necessary, likewise, that a proper person should go over every meadow at least twice every week, to see that the water is equally distributed, and to remove all obstructions arising from the continual influx of weeds, leaves, sticks, and the like.

In February, a great deal depends upon care and caution. If you now suffer the water to remain on the meadow for many days without intermission, a white scum is raised, very destructive to the grass; and if you take off the water, and expose the land to a severe frosty night, without its being previously dried for a whole day, the greatest part of the tender grass will be cut off. The only ways to avoid both these

these injuries are, either to take the water off by day, to prevent the scum, and to turn it over again at night, to guard against the frost ; or, if this practice be too troublesome, you may prevent both, by taking the water off entirely for a few days and nights, provided the first day of taking off be a dry one ; for if the grass experience one fine drying day, the frost at night can do little or no injury. The scum is generated chiefly by the warmth of the sun, when the water is thin, and used too plentifully. Towards the middle of this month, we vary our practice in watering, by using only about half the quantity of water which we do earlier in winter ; we now rather only *wet* than *water* the land. At this season, the method (which I have noticed above) of using repeatedly the same water, will prove nearly as efficacious as that adopted in this county ; for all that is now required, is to keep the land in a warm humid state, and to force vegetation.

At the beginning of March, the crop of grass
in

in the meadows is generally sufficient to afford an abundant pasturage to all kinds of stock, and the water is taken off for near a week, that the land may become dry and firm, before the heavy cattle are turned in. It is proper, the first week of eating off the spring-grass, if the season be cold, to give the cattle a little hay each night.

It is a custom, I am told, with some farmers in Hampshire, to eat off the spring-grass of their meadows with ewes and lambs, in the same manner that we do a field of turnips, by inclosing a certain portion each day with hurdles or flakes, and giving them hay at the same time. This is certainly making the most of the grass, and an excellent method to fine and sweeten the future herbage. In this month and April, you may eat the grass as short and close as you please, but never later; for if you trespass only one week upon the month of May, the hay-crop will be very much impaired, the grass will become soft

and

and woolly, and have more the appearance and quality of latter-math than of a first crop.

At the beginning of May, or when spring-feeding is finished, the water is again used for a few days, by way of a wetting.

“ About a week, says Mr. Boswell, before
“ the grass is to be mown, let the water into it
“ for about twenty-four hours, it will make the
“ ground moist at the bottom ; the fithe will go
“ thro’ it the easier, and it will be mown the
“ closer for it.” This practice, tho’ it may prevail in Dorsetshire, is very seldom advisable, for the following reasons : Water made to run thro’ a thick crop of grass, tho’ it appear ever so pure, will leave a certain quantity of adherent scum or sediment, which can never be separated from the hay, but will render it unpalatable, if not prejudicial, to the cattle that are to eat it. And this wetting of the land and grass will impede the drying or making of the hay, perhaps some days, which, in difficult seasons, is of very
great

great consequence: And it will likewise make the turf too soft and tender to support the wheels of a loaded waggon in carrying off the hay. Besides, I have reason to believe, that one day's wetting in the summer, will, upon most meadows, endanger the soundness of every sheep that feeds upon the after-math.

It is rather remarkable, that watering in autumn, winter, or spring, will not produce that kind of herbage which is the cause of the rot in sheep, but has been known to remove that cause from meadows which before had that baneful effect. If, however, you use the water only a few days in any of the summer months, all the land thus watered will be rendered unsafe for the pasturage of sheep. This I had frequently been told, but did not give it credit till last summer, when I had an opportunity of seeing an experiment made by a friend. At the beginning of July, when the hay was carried off, and the water rendered extremely muddy and abundant, by several days heavy rain, he
thought

thought proper to throw it over his meadow for ten days, in which time a large collection of extremely rich manure was made upon the land. In about a month the meadow was covered with an uncommon luxuriance and blackness of herbage. Into this grass eight sound young ewes, and two lambs, were turned to depasture. In six weeks afterwards the lambs were killed, and discovered strong symptoms of rottenness; and in about a month afterwards one of the ewes was kill'd, and tho' it proved very fat, its liver was putrid, and replete with the insect called the Fluke, or Weevil: the other ewes were sold to a butcher, and all proved unsound.

The above experiment, however, convinces me, by the very extraordinary improvement made thereby in the meadow, that muddy water in the Summer is much more enriching than it is in Autumn or Winter, and ought to be used, for a week at least, every wet Summer, notwithstanding its inconvenience to sheep, the most profitable species of stock.

F

A N S W E R S



ANSWERS TO OBJECTIONS.

WH E N a meadow is first prepared for watering, by cutting of various works, ditches, and drains, they who are as yet unacquainted with the practice, immediately exclaim, that the land is entirely cut to pieces, wasted, and spoil'd. But it may be answered, that if even one fourth of a meadow is consumed by ditches, and the remaining parts produce three times the crop which the whole land before produced, certainly there is no room for complaint.

A second objection is the expence of laying out a meadow, which indeed, in some situations, is very considerable ; but the future expences bear no proportion to the increased value of the land. The common charge of our watermen who go out to give directions, is a guinea a week.

Another

Another objection is, that the hay of watered meadows is by no means equal in value to upland hay ; but this, if it be sometimes true, is not the fault of the land, but the occupier : for most farmers, large in their desires, when they observe, in the month of June, so strong an inclination in their grass to grow and increase, think it a pity to check this inclination, and prevent the increase, 'till at length they have a crop of nearly three tons upon an acre, and the hay is almost as long, coarse, and dry, as wheat-straw. Those farmers, however, who are wise enough to be content with a ton and a half upon an acre, have hay of a quality very little inferior to the best upland hay. This I know from experience.

The Critical Reviewers, in their publication for the month of January, 1789, noting my former edition, make the following objection to watering. “ In clayey grounds, particularly
“ a cold, stiff clay, we have found it injurious ;
“ and this exception our author should have

F 2.

“ pointed

“ pointed out.” This exception, I must take the liberty of saying, it certainly was not my duty to point out ; for I did not know of any such exception, nor do I allow that any such can exist under a proper management of the water. For the soil of a great part of many of our best meadows is a stiff, cold clay, and the clayey part of each is (*cæteris paribus*) always more fertile than any other. Indeed, what soil can be found so grateful, so retentive of manure, and so invariable in its productions, as a cold clay, properly drained ?

There is, however, another objection, and with us a very weighty one, and that is, paying the millers for the use of the water. We have one meadow of sixteen acres which pays six guineas yearly for the water. This must, of course, reduce very much the value of the land ; but if the owner can afford to pay so much for the water, it is a very convincing proof of the superiour utility and excellence of this mode of cultivation.

If,

If, in the above description, I am not found sufficiently clear and particular, I shall not only think it my duty, but shall be happy to answer any questions respecting this business (as far as I am able) that may be proposed by letter, (addressed to me at South-Cerney, near Cirencester, Gloucestershire,) or otherwise. As, however, it is almost impossible to describe fully in words, or by plates, a method which must vary, as the situation of every meadow is different; the best and cheapest way is to send for one of our watermen, who, without taking any level, can immediately discover whether watering be practicable or not, and if it be, will undertake at a moderate rate.

EXPLANATION



EXPLANATION OF THE PLATES.

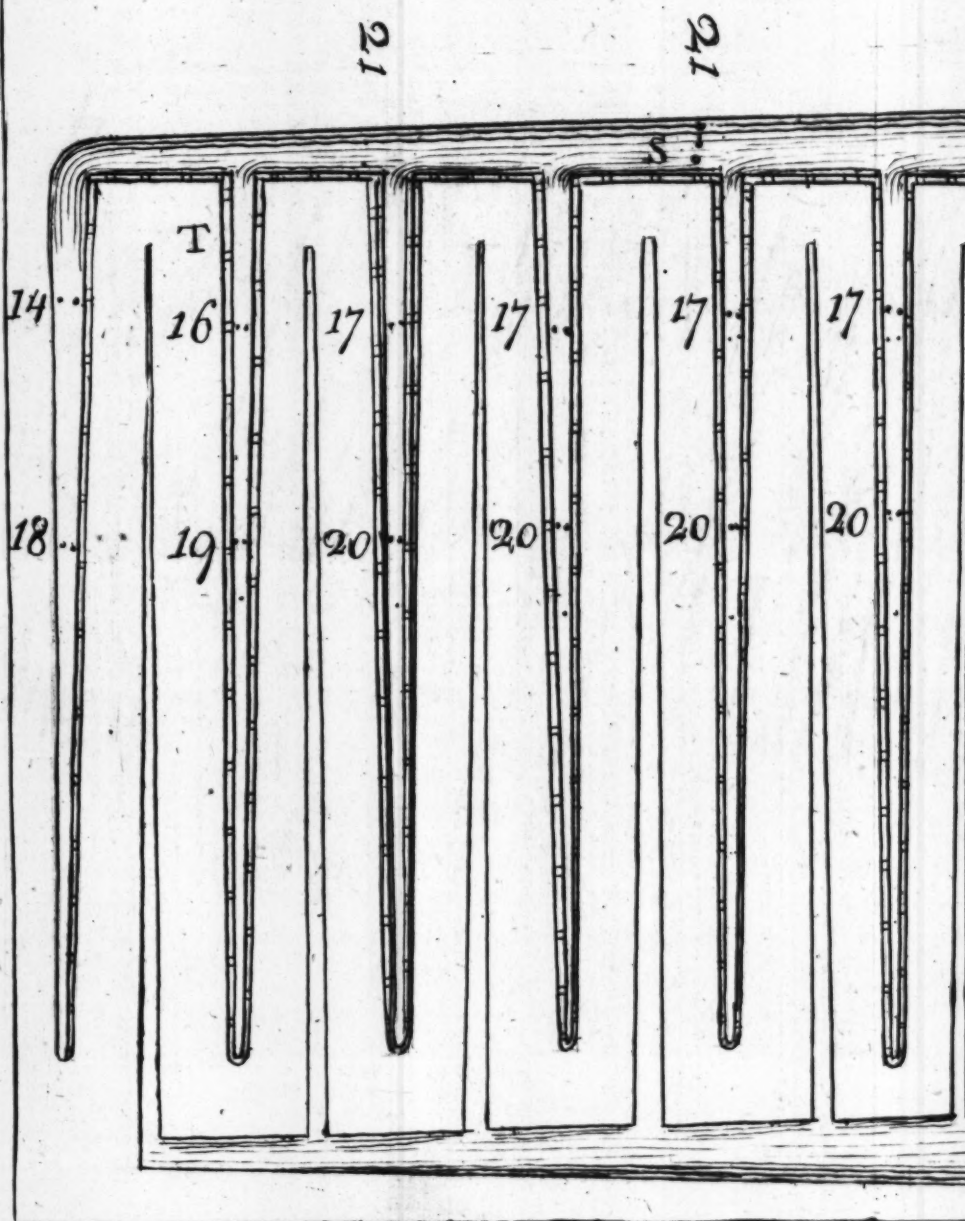
Plate I. represents a meadow with an even surface.

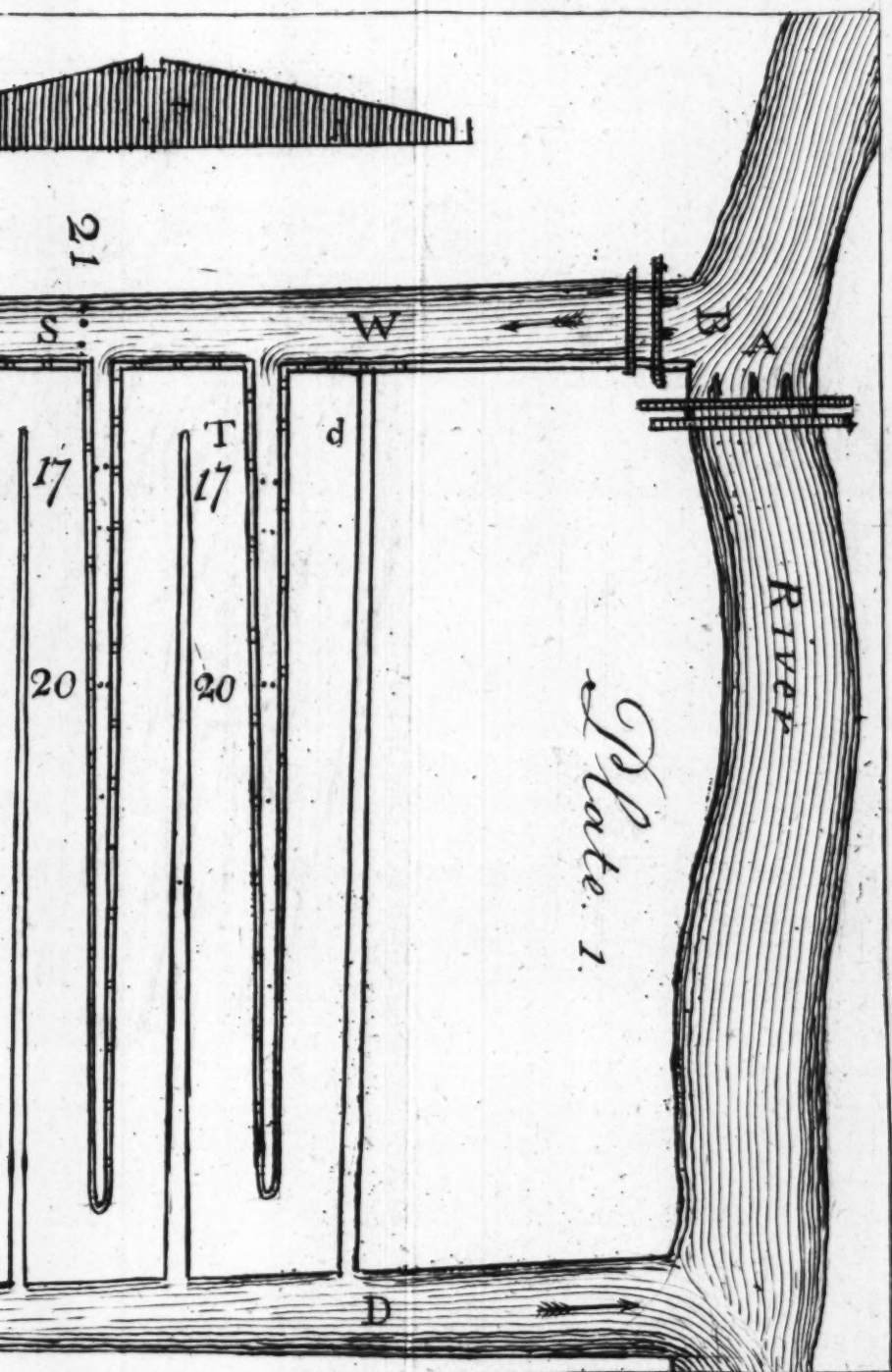
- A. Is the dam in the river, consisting of three hatches.
- B. The flood-hatches at the mouth of the work, thro' which the meadow may be watered at pleasure.
- W. The master-work, or feeder.
- D. The master-drain.
- d. One of the small drains, which extends to the feeder, and by which, when its mouth is opened, and the hatches let down, the whole meadow may be laid dry almost instantaneously, when occasion require.
- T. One of the troughs which branch from the work, and distribute the water.
- S. One of the stops which obstruct the course of the water in the works and troughs, and

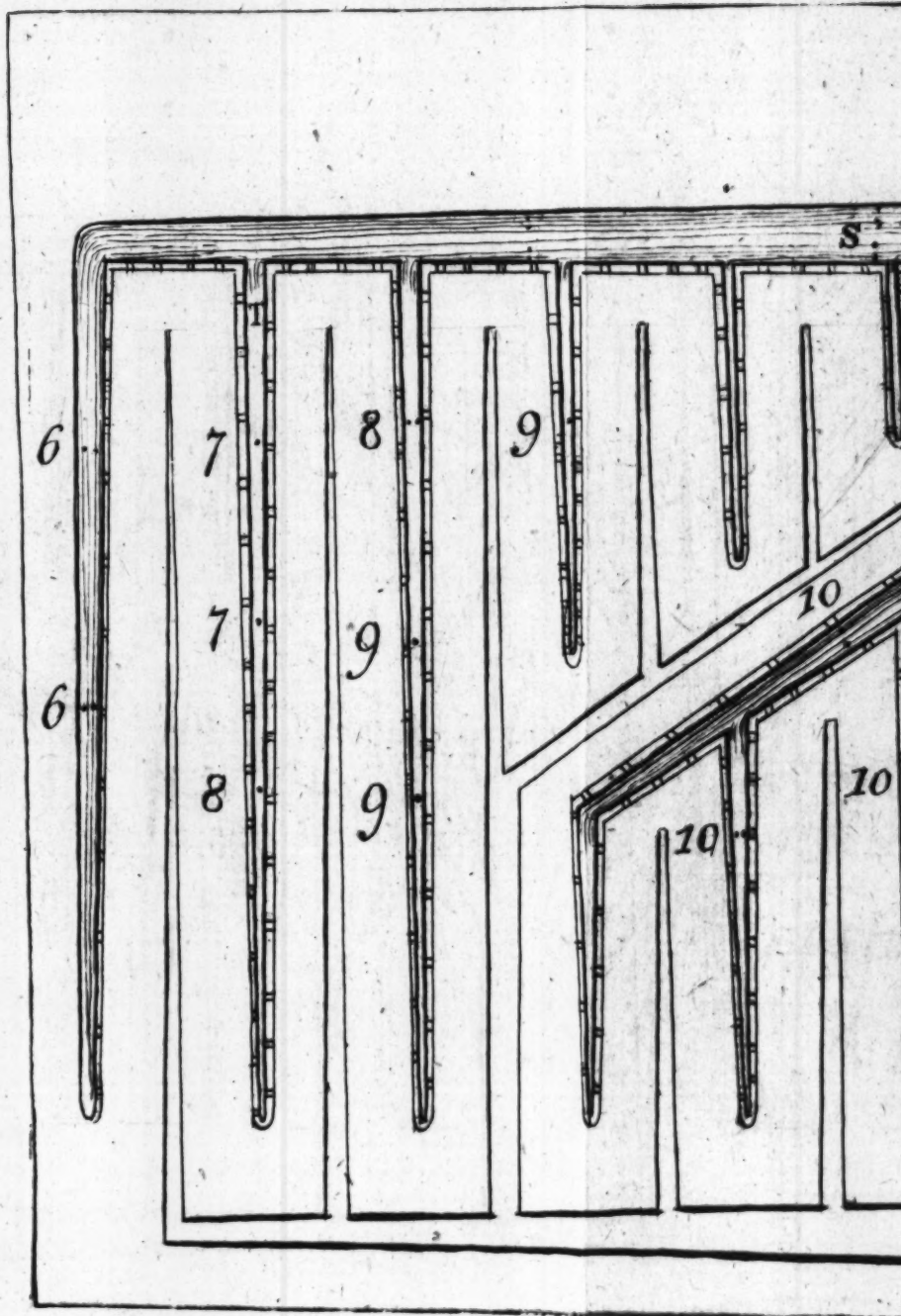




Fig. 2.







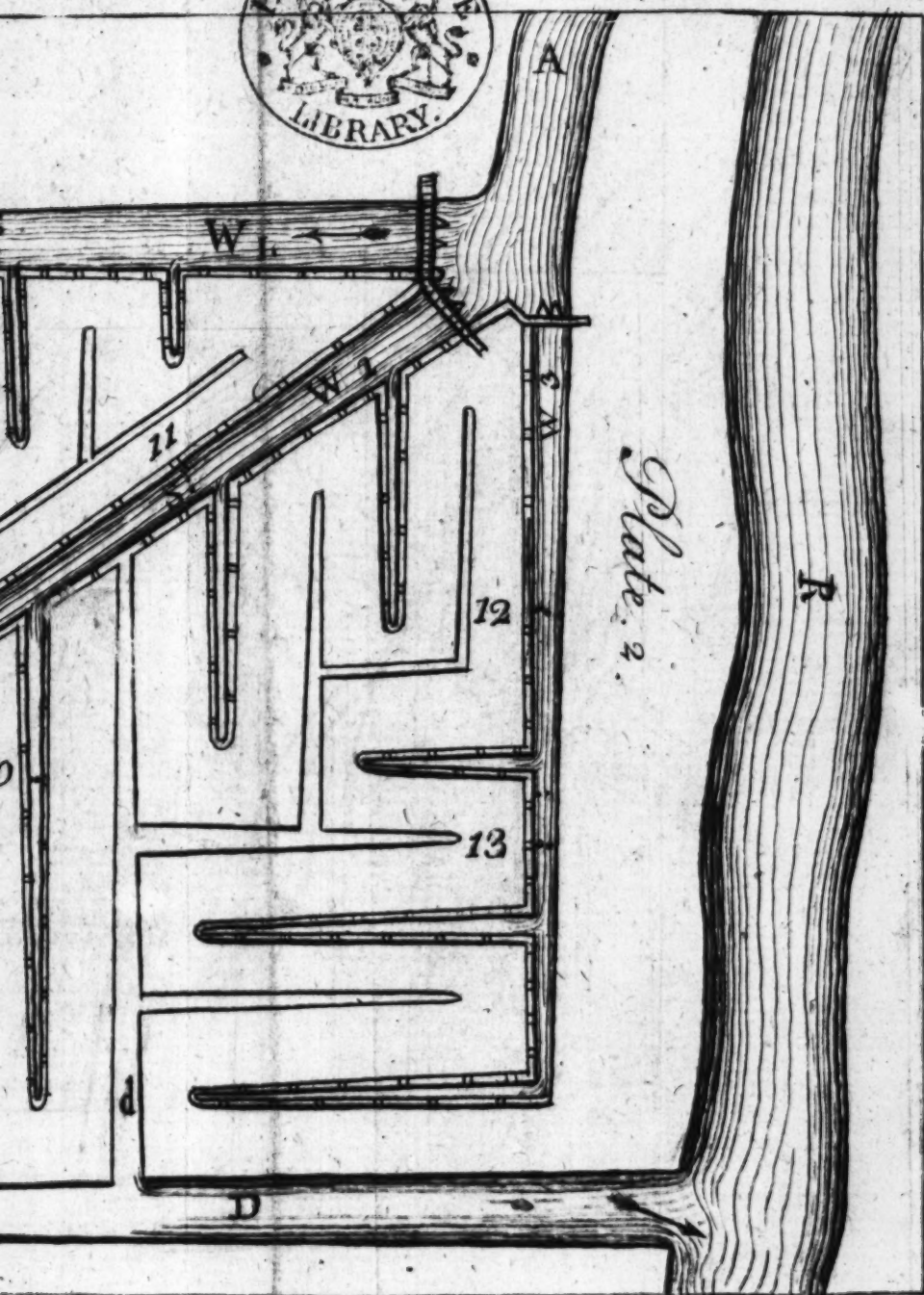


Plate 2.

and keep it high enough to flow through the notches, or small apertures, made purposely in the sides of them.

Figure 2. is intended to represent the profile, or elevation, of two lands in a watered meadow.

Plate II. represents a meadow with a very uneven surface.

A. Is a large ditch, cut deep enough to receive the water, without a dam in the river, at a distant and higher part of the stream, by which means the water gains several inches of fall, and the current is the quicker upon the meadow.

W. 1. Is the master work which waters the highest and most distant part of the land.

W. 2. Is the diagonal work which waters an eminence in the middle of the meadow.

W. 3. Is a smaller work, which waters a lower part adjoining the river.

d. The

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- d. The small drain, which has immediate communication with one of the works, as in Plate I.

THE END.

